p1020: graded take-home open-note practice exam (version 205)

Question 1

Let f represent a function. If $f[22] = 33$, then there exists a knowable solution to the equation below.

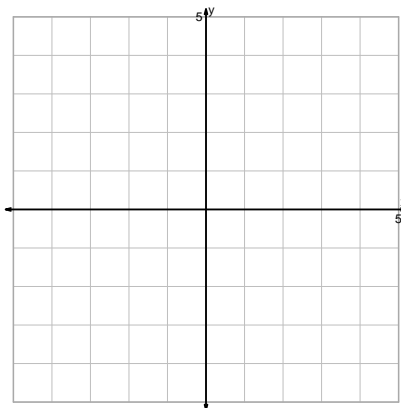$$y = 4 \cdot \left(f\left[\frac{x}{18} + 20\right] - 27 \right)$$
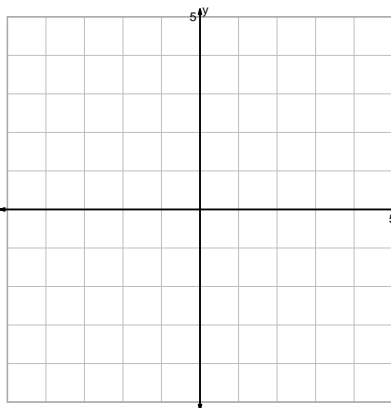
Find the solution.

$x =$

$y =$

Question 2

Graph the equations accurately. For each integer-integer point on the parent, indicate the corresponding point precisely. Also, with dashed lines, indicate any asymptotes.
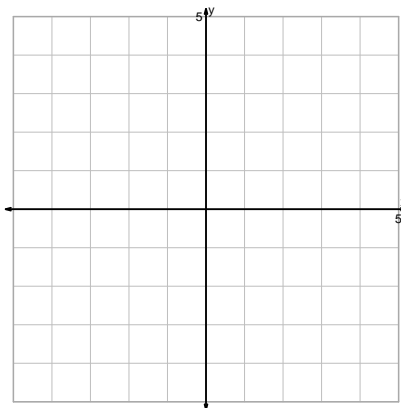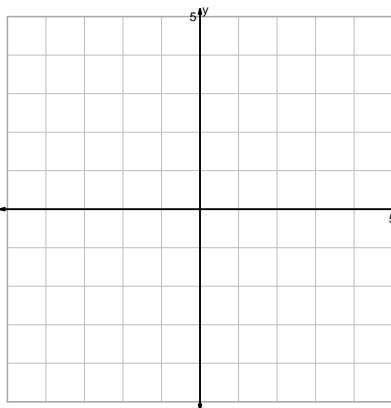
$y = \sqrt[3]{2x}$

$y = 2 \cdot x^3$

$y = 2^{-x}$

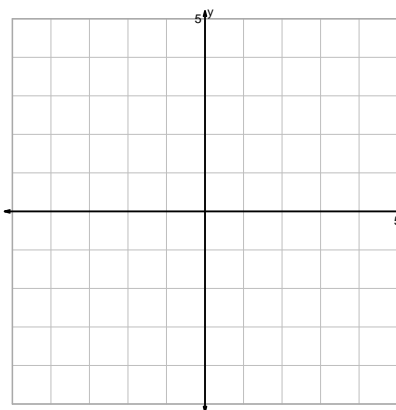
$y = \log_2\left(\frac{x}{2}\right)$

$$y = x^3 - 2$$
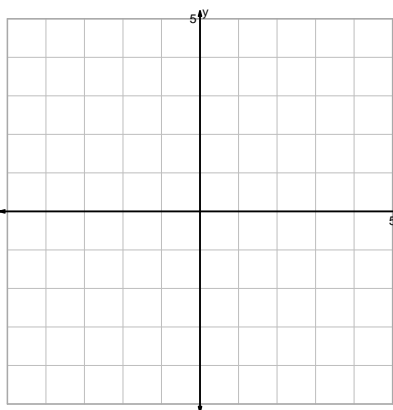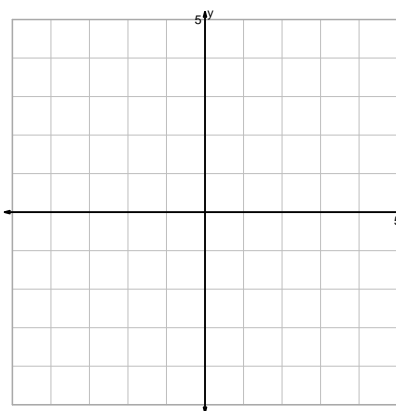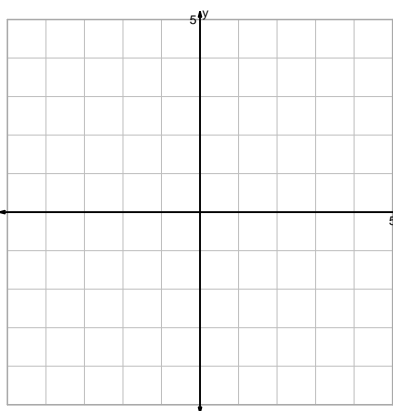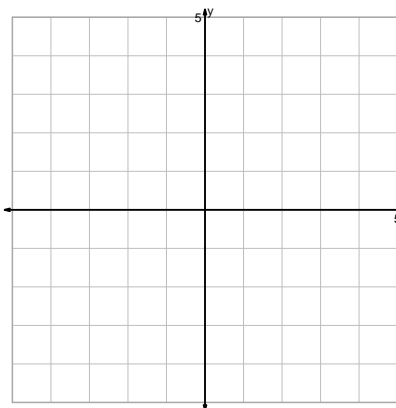
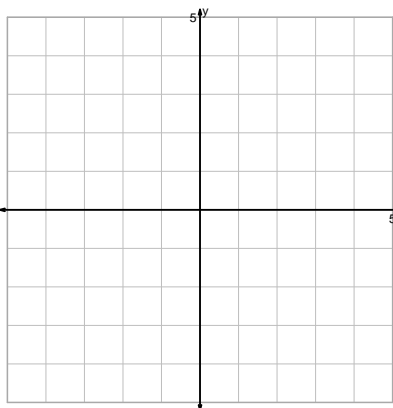$$y = \frac{x^2}{2}$$

$$y = 2^{x+2}$$

$$y = \left(x - 2\right)^2$$

$$y = -\sqrt{x}$$

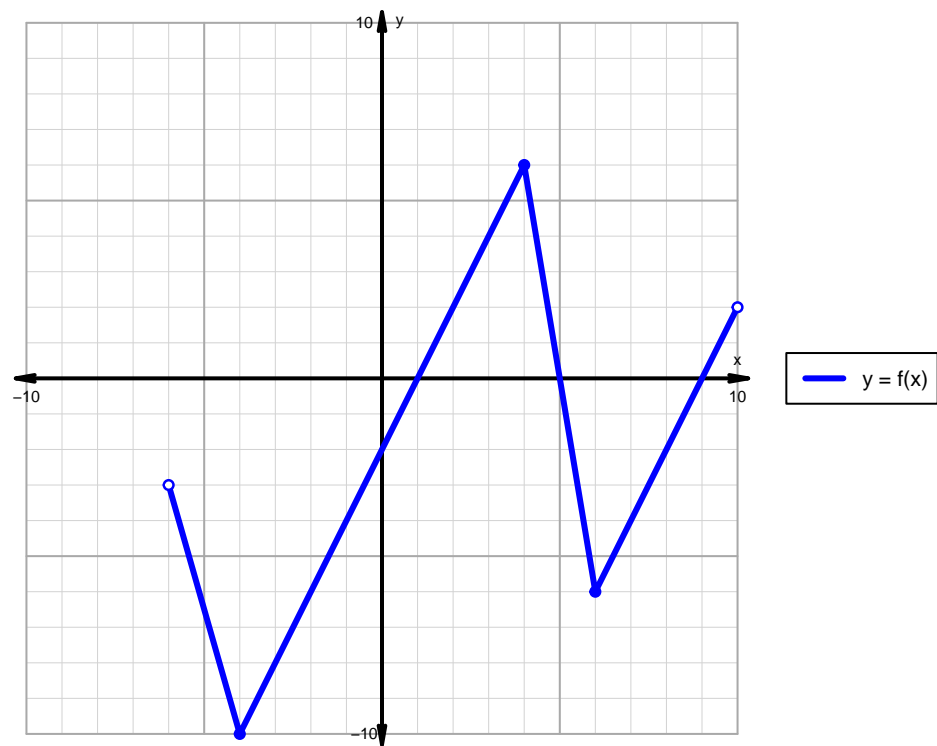$$y = \sqrt{x} + 2$$

Question 3

A function is graphed below.

Indicate the following intervals using interval notation.

Feature	Where
Positive	
Negative	
Increasing	
Decreasing	
Domain	
Range	

Question 4

Let f represent a function. The curves $b = f[a]$ and $y = 4 \cdot (f[2x - 3] + 6)$ are represented below in a table and on graphs.

a	b	x	y
-97	5	-47	44
-85	-30	-41	-96
37	4	20	40
39	10	21	64

$b = f[a]$

$y = 4 \cdot \left(f\left[2x - 3 \right] + 6 \right)$
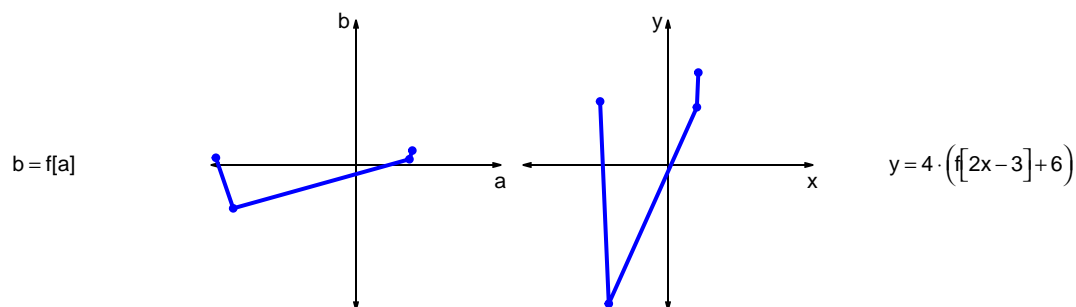
a. Write formulas for calculating x from a and calculating y from b. (Or, write the coordinate transformation formula.)

b. What geometric transformations (using words like translation, stretch, and shrink), and in what order, would transform the first curve $y = f[x]$ into the second curve $y = 4 \cdot (f[2x - 3] + 6)$?

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Question 5

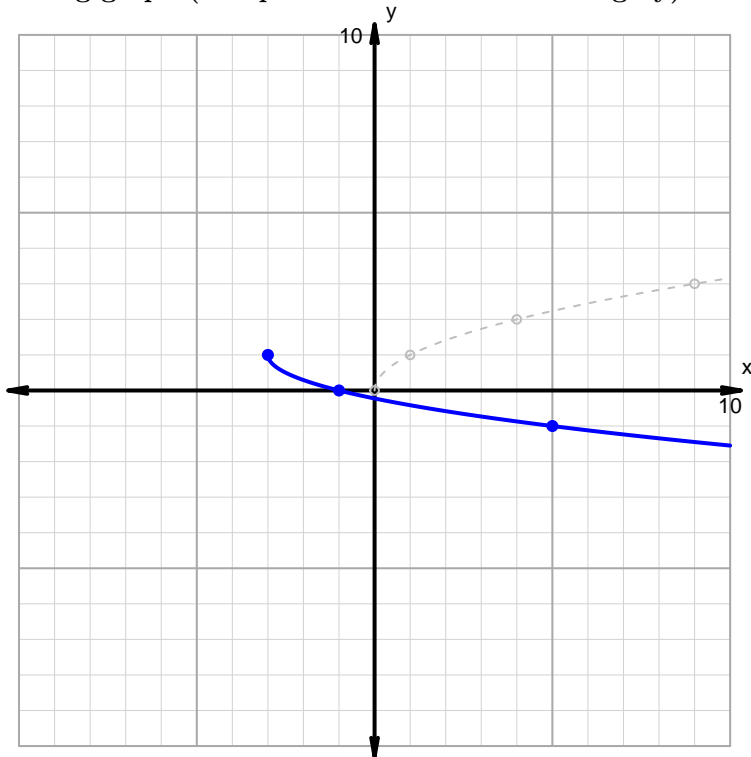A parent square-root function is transformed in the following ways:

Horizontal transformations

1. Horizontal stretch by factor 2.
2. Translate left by distance 3.

Vertical transformations

1. Vertical reflection over x axis.
2. Translate up by distance 1.

Resulting graph (and parent function in dashed grey):

- What is the equation for the curve shown above?

Question 6

Make an accurate graph, and describe locations of features.

$$y = \frac{1}{2} \cdot |x + 2| - 2$$

Feature	Where
Domain	
Range	
Positive	
Negative	
Increasing	
Decreasing	